



A New Perspective

Graeme Francis investigates the changing attitudes toward irrigation.

For many years new irrigation product development has concentrated on providing precise and accurate watering. The major manufacturers have worked on control systems developed with the emphasis on irrigation linked to turf water requirements. The development of communication between controllers and pump stations to allow accurate pump operation based on demand is another major area of attention with the aim of reducing power costs and to allow actual water use monitoring.

A survey of the US irrigation industry indicated that 82% of respondents believe 'smart' controllers that apply water based on actual or historic climate data will out number those based on time within 5 to 10 years. This trend is also being seen in the UK. Other peripheral technology such as weather stations measuring ET and other environmental data that download this information to control systems are growing in popularity.

We now have sprinklers with variable arc, trajectory, radius and pressure features all designed to place water uniformly and in the right place while making adjustment and servicing as simple as possible.

Much has been written about irrigation technological advancement, but how much of this technology, particularly the more sophisticated control systems and pump stations are actually being installed? Is our understanding of why we need these products and how to use them good enough? Too many golf courses are still being provided with irrigation systems that don't even use technological innovation, such as individual head control, that has been available for over 20 years let alone the state-of-the art products being introduced at present.

Why is this happening? Is it because irrigation is considered unimportant and therefore it suffers when clubs consider capital expenditure projects? Is it because technological innovation is not being promoted? Is it because clubs are not given advice on the benefits that these irrigation products can bring? Does precise irrigation practice based around water conservation matter?

Clearly the point is, in some cases, being missed, but it does matter and matters now. If the assumption that golf cannot survive without water is correct, then be prepared for sustainable water availability becoming the most single important aspect of golf course maintenance.

GOLF AS A WATER USER

In a recent report from an international forum, the United States was reported as the most wasteful water user in the world. Golf was mentioned as a key reason for this wastefulness. The golf industry is considered in some quarters as a highly inefficient user of water. Some environmental organisations list statistics comparing global golf course irrigation water use with global water available for drinking.

While it is true that the US model does not entirely compare with the situation here, we do see examples of similar criticism in the UK. Whether such criticism is justified or not, the golf course industry has to be aware that it is perceived a wasteful water user.

WATER RELATED LEGISLATION

A more direct reason, than this public perception, why we need to review water use for golf is legislation. The Groundwater Directive 80/68/EEC and Groundwater Regulations 1998, the Water Framework Directive 2000/60/EC and the Water Act 2003, The Water Environment and Water Services (Scotland) and the Water Environment (Water Framework Directive) Regulations (Northern Island) 2003 are the most important examples of current water related European initiated legislation that has a direct impact on all golf courses in the UK.

It is expected that water legislation will become more restrictive in years to come and that water availability will be on a prioritised basis with the drinking water supply as the highest and leisure as the lowest. The UK population continues to grow and hot spots of population growth such as London will put increasing demand on our water supplies. Obtaining water for golf from the drinking supply will become restricted, expensive and ultimately could be prevented.

WATER MANAGEMENT PROGRAMMES

It is certain that to sustain golf, clubs will need to prepare and implement a course water management programme. Some course managers already have such plans, but every club needs to create its own programme.

Implementing such a programme provides an opportunity for us to demonstrate that water conservation is a crucial and essential part of golf course management and that the industry is making attempts to use water as efficiently as possible.

The development and implementation of a course water management programme with full investigation of areas alternative sources of water, treatment of borehole water previously unsuitable for irrigation, the use of grey water, treatment and recycling of wash down water and the provision of water efficient irrigation systems is not only good management, but is a tangible example of how golf is dealing with the water issue.

IRRIGATION SYSTEM EFFICIENCY

How do we measure irrigation system efficiency? It is likely that few course managers could put an accurate figure on the efficiency of their system. Carrying out a system audit allows this to be established and is a key part of any water management programme. The audit will produce calculated figures for operational factors such as uniformity of coverage and define water requirement.

This information then provides the basis upon which the need for system modification, adjustment or replacement can be assessed and allows the development of schedules to improve efficient water use. Golf course irrigation audits are still extremely unusual in the UK, but they should become part of a club's water management plan.



ALTERNATIVE SOURCES OF IRRIGATION WATER

Courses with fairway irrigation still represent a small proportion of total number in the country. The number has grown at an accelerated rate over the last 15 years with many clubs and operators recognising that the ability to water fairways has a serious commercial benefit. Availability of adequate quantities of water for this, however, is becoming increasingly difficult.

It has long been known that alternatives to potable water for irrigation have to be sought. It will become prohibitively expensive and probably unavailable.

The normal alternative to potable water has been to obtain a licence and sink a borehole or take water from a watercourse during the winter for use during the summer. However, in parts of England the Environment Agency will no longer issue abstraction licences for water to be used to irrigate fairways regardless of the abstraction or storage method. It should not be assumed that boreholes or winter abstraction will provide irrigation water in the future.

Other sources of water are becoming more prevalent. There are a number of cases in the UK where the effluent water from an onsite facility, such as a hotel, is now being used. Treatment plants and water storage systems have been put in place to make this water available for the course. These courses have facilities to generate sufficient effluent, but the grey water option should not be dismissed if you do not have a hotel on site.

One golf club has worked with the Environment Agency and installed a system to treat effluent water from the clubhouse. In return, the Environment Agency will grant a licence for the balance of the water required for irrigation. The provision of a relatively small treatment plant of this type has major financial and environmental benefits. The willingness of the club to invest in an alternative water source has created a sensible and viable way in which to work with the Environment Agency to provide a solution to the problem.

The installation of effluent water treatment plants at golf courses to provide irrigation water should now be seriously considered as a practical and real part of golf club management.

In certain parts of the country the borehole water available to a course may be unsuitable due to its pH or high soluble iron content. Once again, clubs are beginning to invest in equipment to bring this water up to an appropriate quality. Progressive course managers are taking a wider view of water sourcing and recognise that the capital investment in modifying available water will reap huge future benefits

WATER RECYCLING

Water farming, where surface water is collected and stored from irrigation use has been used here for many years and is still a consideration. But the most widely seen example of water recycling, while using smaller quantities, has been the installation of biological wash down water treatment and recycling systems that are proliferating. For some years, clubs have been installing these systems to ensure compliance with The Groundwater Regulations that make it illegal to wash substances such as diesel, oil and chemicals into the ground and surface water systems.

The fact that these systems recycle water and reduce wash down water consumption by as much as 90% will grow in significance, as the use of drinking water for wash down operations will become unacceptable and prohibitive expensive.

SUMMARY

Very little of the subject matter covered in this article is new. In every case, the methods outlined here for obtaining and conserving water have been utilised to some extent in the UK. Much of this has been driven by necessity or because large quantities of water are needed, but every club needs to take a look at its position. An 18 hole course using 5400m³/1.2 million gallons of water annually to water greens and tees will find that assessing the benefit in reducing its dependency on potable water is a very worthwhile exercise, because one day the tap may simply stop running.

The time has come for much greater emphasis on water on the golf course. The use of innovative irrigation products within a well designed, well installed and well maintained system is an important part of water management, but unless they are utilised and water is available the best products are worthless.

We have to appreciate that the issues relating to water availability for golf course irrigation will become increasingly acute. Plans and policies within a course water management programme need to be put in place now so that water will be available for golf course irrigation in the future.

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